SCIENCE NEWS-LETTER

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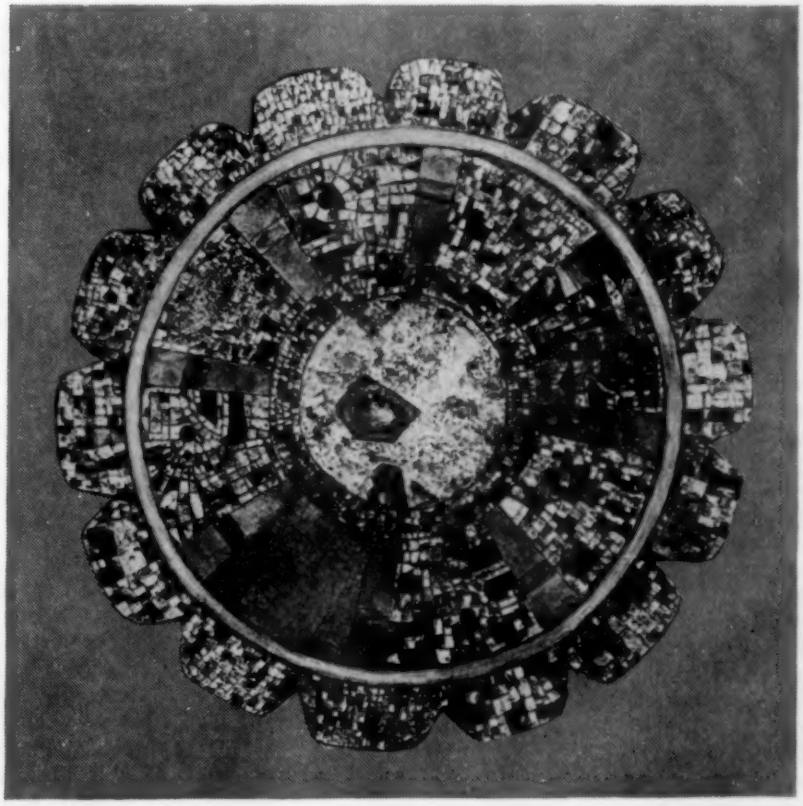

MAYA RELIGIOUS TREASURE

Turquoise Plaque Lay Hidden for Centuries

(*See page 220*)

Vol. XIV *No. 392*

Maya Religious Treasure Exhibited in U.S.

Archæology

A turquoise plaque, that lay hidden for centuries in the ruins of the ancient Maya city of Chichen Itza, in what is now Yucatan, forms the subject of our cover this week. It was resurrected by scientists of the Carnegie Institution of Washington, and restored by S. Ichikawa, of the American Museum of Natural History. At the recent International Congress of Americanists in New York it was displayed, and later it was placed on exhibit in Washington.

The plaque was found in the Temple of the Warriors.

For four seasons the Institution staff has been engaged in the excavation and restoration of this beautiful Maya structure. In 1927 it was discovered that two chambers of a still more ancient temple lay hidden in the pyramid foundation which supports the Warriors' Temple. Excavations conducted by Mr. Earl Morris of the Carniegie staff, disclosed the fact that the builders of the newer temple, instead of demolishing the older structure filled its rooms with rubble and covered them over.

After the rooms had been cleared of the filling and the walls had been shored up to prevent collapse under the enormous weight of the newer structure, Mr. Morris began systematic search for ceremonial treasure. In the east room of the entombed temple he found unmistakable signs of an altar that had disappeared. He cut into the floor where it once stood. Near the rear wall his pick touched an object unlike the materials of which the floor was composed. Presently the lid of a limestone jar was exposed. With infinite care, the jar with its precious contents was removed from the place where it had been deposited centuries before, doubtless to the accompaniment of strange and weird ceremonies. It was carried to a room at staff headquarters where it could be examined with every precaution against damage.

The turquoise mosaic, the principal item in this offering to the gods, is between eight and nine inches in diameter. The body of the plaque, which was of wood, has been reduced to a brown powder with the result that the mosaic was held in place only by the paper-thin film of adhesive matter by which the turquoise pieces were encrusted upon the wood. Two-thirds of the mosaic was relatively intact.

At the center of the plaque there is a disk of pinkish substance, about two and one-half inches in diameter, which is either fine sandstone or a paste containing much sand. Encircling the central disk is a narrow unbroken ring of turquoise mosaic. Outside this there is a concentric band divided by radial strips of vegetable material into eight panels, each approximately two inches wide at the outer edge. Four of these panels are of plain mosaic, but the alternating set bear decoration, in each case, consisting of the head and claw, of a reptilian creature seen in profile.

Approximately 2,500 pieces of turquoise were used in making the mosaic. Most of these pieces are so thin that the field equipment of the staff at Chichen Itzá contained no instruments of sufficient delicacy to measure them accurately. In quality the material ranges from a very good grade of blue to a greenish white. Most of these elements were skilfully shaped to the places they were designed to occupy, hence very little of the black cementing material is visible except where the artist intended it to form a part of the pattern.

Mr. Morris in speaking of the significance of the plaque says:

"It stands among the finest examples of aboriginal American art. It is the first to be found within the Maya area. It was found in a definitely recognized and datable archaeological horizon. Moreover, the interest which the plaque commands for all these reasons is in no wise lessened by the realization that the tiny bits of stone composing it probably were mined in Arizona or New Mexico, fashioned and combined into beautiful form in or not far from the Valley of Mexico, then transported through some hundreds of miles of jungle finally to be sealed away as a dedicatory offering beneath a temple floor."

Science News-Letter, October 13, 1928

In This Issue—

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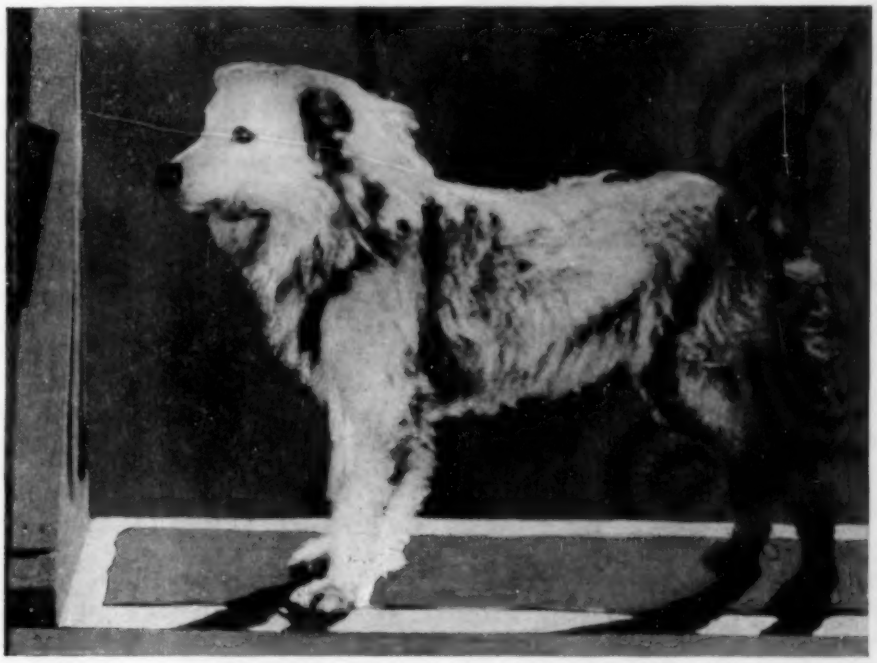
Scientists to Explore Dog's World

Psychology

By Emily C. Davis

Fame pursues dogs that make good as well as men. Fellow, the German shepherd dog that demonstrated super-dog intelligence before Columbia University psychologists, has been given the new honor of having a scientific fund named after him, the Fellow Fund.

Since this dog came up to Columbia and displayed his ability to respond to 400 different words used in commands, Dr. C. J. Warden, who conducted the college examination. has been fairly besieged by dog owners. Every one is sure that his pet is just as bright as the dog that took the tests. Every one wants to talk "dog". When would Dr. Warden like to make a test of a really remarkable Airedale? Would he please explain how the family collie found her way home after being left 300 miles away in the country? And how can it be possible that dogs do not see the world in colors, when Jiggs, a Skye terrier, always knows his own blue plate that is just the same size as a set of white ones?



HANDLING A DOG in the Pavlow laboratories during an experiment to learn more of the world of dogs

To all of this gratifying interest in one of his own pet subjects, Dr. Warden has had to answer that he could test no more dogs, and that scientists have scarcely ventured over the threshold of the strange world that a dog lives in. Finally, the idea of raising a fund with which psychologists could make a comprehensive study of dogs at Columbia University sprouted, with Fellow as its mascot, Dr. Warden as its chairman, and Dr. John B. Watson, exponent of behaviorism, as its treasurer. If the fund flourishes there will be a systematic program of experiments with dogs, perhaps a building devoted to the study of animals.

What is needed, Dr. Warden says, is exact knowledge about dogs, determined by careful experiments, to replace the great mass of contradictory lore about pets that have gone down in family history. Almost any dog owner can talk indefinitely about the cleverness of his dog. But much of what the average man "knows" about the dog and about dogs in general is quite "unknown" to the animal psychologist, Dr. Warden points out.

To take one angle, a woman says that her Scotch terrier, Lassie, recognizes colors. This is perfectly obvious, because Lassie always lies on a red cushion. Once the family mixed up the cushions and put a blue cushion on the chair that was ordinarily adorned by the red one. But Lassie wisely looked about and climbed up on her own red cushion.

Interesting, comments the psychologist, but—. Did you have the cushions cleaned before the test, to make sure that Lassie did not know her own cushion by the associated smell? How do you know that Lassie did not recognize her cushion by sight without seeing colors? If dogs are color blind, as most psychologists think they are, they see the world in shades of gray—gray meat, gray trees, gray rabbits and gray cushions. A red cushion would appear much darker gray than a light blue one, and it is possible that a dog might detect this difference in brightness, even though a dog's sight is not nearly so good as a human being's. And, a third point, are you sure that you did not carelessly talk about the test while Lassie was looking for the red cushion, and that you did not give added clues by indicating the location of the red one, or by laughing to show that the situation was unusual?

Many dog stories wil not stand up under cross questioning. It is not that the dog is less remarkable than its owner thinks. On the contrary, a dog will probably seem much more remarkable when human beings understand how it really does respond to slight cues and confusing commands.

You can get a vague idea of what a dog's world is like merely by imagining yourself without the power of speech. You can imagine a man calling, saying, "Here, Rex, come get your dinner." You have heard those sounds, spoken in that tone many times, and they suggest eating, just as much as the smell of food suggests eating. But you have no complex filing cabinet in your brain where you analyze those sounds into words made of alphabet letters, or where you differentiate between nouns and verbs. Probably, if the man's tongue got twisted and he said thinner, or winner, in the proper tone, you would come up expecting to be fed, if you grasped the situation at all.

If you failed to understand, the man would probably elaborate, saying, "Come, Rex, nice bones," meanwhile leading the way toward the back porch or holding out a plate with the meat. And, so, by the various associations of hearing, sight, and smell, you, being a bright (*Turn to next page*)

Exploring a Dog's World—*Continued*

dog, would grasp the "idea" of dinner, much more quickly than this can be written or read. But as for understanding the words, a dog's understanding might be compared perhaps to that of a baby when he answers to "go" and a few other words by fitting an accustomed response to the sound.

Dr. Warden, who recently surveyed the present state of scientific knowledge about dogs, found it necessary in his report to say over and over, "experiments indicate", or "it seems likely". Experiments have never been carried through to prove how good or how poor a dog's senses may be, or how much the keenest of dogs may differ from the dog who lacks the "it" of canine personality. Nobody knows very much about the intelligence of dogs, let alone whether an Airedale is brighter than a poodle. The bulldog has been called the most stupid of dog breeds, but there is no way at present of distinguishing between a moron bulldog and an occasional super-intelligent bulldog.

Summing up what science has learned so far, Dr. Warden declared: "It seems probable that the average dog is far more sensitive to odors than is man; that he is not strikingly unlike man with respect to sensitivity to sounds; that his vision for still objects is decidedly inferior to that of man, while his acuity with respect to moving objects is great, although there is not sufficient data to warrant a comparison with man in this respect."

Pronouncing upon the learning ability of a dog, which is an indicator of its intelligence, Dr. Warden said: "The dog appears to be superior to the cat, slightly inferior, perhaps, to the raccoon, and probably inferior to monkeys and apes."

This line-up of the animals, however, Dr. Warden hastens to explain, is based on experiments which may not be equally fair to the different animals. A dog's paws are notably clumsy as compared with a monkey's hands, or even with a raccoon's forepaws.

Dr. John Watson, in an interview, deplored the dearth of knowledge about dogs.

There has never been a single piece of research to show conclusively what a dog's sense of smell is able to do for him, the psychologist stated. This is particularly surprising, in view of the fact that the sense of smell is the dog's most important sense.

Thinking back to the time when he studied dogs, before he worked up in the scale to investigating the emotions of babies, Dr. Watson described a simple experiment with the dog's ability to follow a trail, which he himself planned but never carried out.

"I was going to set out and wander in devious ways for two miles or so," he said. "At a set time, the dog would be turned loose, and I would time him until he found me. The route would lead partly through swampy land, so that the dog's backtracking could be followed and recorded, showing where the trail presented difficulties and what the pattern of the route was like.

"Such a piece of experimental work on backtracking and trial and error in picking up a trail has never been done. I never go hunting that the dog does not overrun the game, and yet the processes that the dog follows have never been investigated."

Fifty years ago, when exact experimenting with dogs was a very young science, Romanes set an example of this sort of experiment, Dr. Watson pointed out. Romanes had six people walk along, each stepping in the others' tracks. Romanes' setter was turned loose to follow at a distance. After a time, Romanes himself stepped aside and went in another direction. The dog quickly left the main trail, where the others were still walking, and followed the psychologist.

Most dog owners would jump to the conclusion that the setter was faithfully following its master. But Romanes continued the experiment. He found that the dog would not trail him if he wore a new pair of shoes, and it did trustfully follow a stranger in a pair of Romanes' old shoes. When paper was pasted all over Romanes' old boots the dog was at a loss to find the trail, but when a bit of the paper had worn off, the setter picked up the trail and came tearing after him.

But, like so many experiments with dogs, even this one started fifty years ago has never been carried through to a satisfactory conclusion. How would other setters compare with this one on the same test? Would a different breed of dog act in the same way? What influence does the wind have in helping or hindering the dog?

A series of tests several years ago in Germany showed that dogs are not to be depended upon in tracking criminals, Dr. Watson pointed out, at least not until the dog's sense of smell is better understood. The tests showed that the police dogs and prize winners in other breeds could not reliably follow a fresh human trail among other recently made trails. In another of the tests a dog was given the glove of a person and told to select the owner who stood with nine other men in a line. If this worked, hats and other possessions carelessly left by a criminal at the scene of a crime could be used in identifying the guilty suspect. But the dog failed entirely to fit the glove to its owner. As a result of the investigation the Prussian government forbade use of dogs in criminal detection.

Some day dogs may be useful for this purpose—when communication between man and dog is clearer, when it is certain that the dog understands what is expected of him, and when the man knows what the dog is trying to do.

Just when the dog's detective career seems likely to be suspended pending further develpoments, new evidence about the dog's hearing ability shows how useful it may be in this field. At the laboratories of Ivan Pavlov in Moscow, it was shown that dogs can detect notes pitched so high that human beings cannot hear them. This sensitiveness to "invisible" sounds may account for a dog's uneasiness when burglars are quietly at work gathering up the silver. Some of the dog's keenness is due to its ability to hear fainter sounds than a man ordinarily notices. It is also possible that burglars at a safe make noiseless noises too high in the scale for their own cautious ears. But these tests need to be corroborated by further studies since other cues than sound may have operated.

A use has been found for the dog's ability to catch high notes. In some German cities where dogs are still part of the police force, ultra-high whistles have enabled the policemen to call a dog without at the same time calling a thug or bandit away from his job.

Men will probably depend less upon a dog's sight in the future, when they realize that a dog cannot necessarily see what a man can. The evidence that dogs are probably color blind suggests that a dog's surroundings appear to him somewhat as the world looks in the evening, just as dusk is beginning to gather. At that time we can still see with fair distinctness, but colored objects are (*Turn to page* 227)

Imprisoned Light

Physics

By Edwin E. Slosson

Can you conceive of a thing moving perpetually towards a particular point with the greatest possible speed and yet never being able to reach the point because the nearer it gets the slower its approach?

Well, whether you can conceive of it or not, this is what you are expected to accept among the other curious consequences of Einstein's theory of relativity. If a mass of matter, say a stray stone or a shooting star, travelling through space, passes close to the sun, it will be pulled a bit out of its straight course and, unless it is going by too fast to be stopped, it will come around the sun in a spiral, getting closer and closer each time around until it finally falls in. Or, if it is going a little too fast to fall, it will continue to revolve forever around the sun like a miniature planet.

All this about the behavior of falling bodies has been known since the time of Newton. But Einstein first surmised, what eclipse observation subsequently proved, that a ray of light behaves in the same way. If a ray of light from a star passes close to the sun it is pulled a bit out of its straight course, and would fall into the sun or become its satellite if the light did not travel at too high a speed, in fact at the highest possible speed. But the sun is too big and bulky to lasso a ray of light as it flies by at the rate of 186,000 miles a second. If the sun were solider, if it were as small as one of the minor planets with its present weight, it might capture light and hold it in perpetual captivity.

Now, according to modern notion, all matter is made up of atoms and each atom is constructed like the solar system but with this difference, that nearly all of the mass of the entire atom is concentrated in the central nucleus which serves as the sun of this atomic system. Here matter is intensely condensed into an almost inconceivably small sphere. If we regard it for convenience in calculations as a mere mathematical point, we shall reach the remarkable result that a ray of light headed toward it would never reach it. It would circle around the nucleus forever in an unending spiral, continually coming closer but never getting to the central point in all eternity. For, as it figures out, the nearer the light gets to the center the longer it takes to make the next to the inner circle though its velocity remains the same.

It may aid you to get a conception of this Einstein idea of space and matter if you try this simple experiment. Stretch a sheet of thin rubber like that of a toy balloon over a ring frame such as the ladies use for embroidery. The smooth, flat surface represents empty space, and a little worm making his way across it in a straight line could serve as a ray of light. Push your finger up on the underside and make a hump. This slows up the progress and diverts the direction of the travelling worm as he crawls up its slope. Such humps and hillocks stand for the particles of matter which impede and pervert the passage of light by causing curves in the surrounding space. Now stick a pin up from below, pulling up the rubber by the head like a mountain peak with sides increasing in steepness toward the top till they become perpendicular. To a worm such a mountain peak would be as high as heaven, and if he attempted to climb it he would find it harder and harder to ascend the farther up he got.

Do you get the idea? Perhaps you don't. Perhaps nobody can. But it may be true. The universe is not limited by our imagination.

Science News-Letter, October 13, 1928

Mound Yields 100 Skeletons

Anthropology

The excavation of an Indian mound located in the Oakwood Cemetery at Joliet, Illinois, has yielded 100 skeletons, in addition to various weapons, implements, and ornaments. The work was part of an archaeological survey of Illinois, under the direction of Dr. Fay-Cooper Cole of the University of Chicago, and W. M. Krogman, director in charge of field work.

An unusual feature of the exploration was the discovery of five cases in which mother and child had been buried together, the child clasped in the mother's arms in an eternal embrace. In each instance the age of the child was one year or less.

Of the 100 skeletons found, 22 were of persons under 2 years of age, 22 aged 2 to 16 years, 4 aged 16 to 60 years, and 10 over 60 years of age, while three were too fragmentary to classify. The preponderance of females among the adults was also noteworthy. There were 36 women, as against 12 men, a ratio of 3 to 1. The only explanation of this situation may be found in the fact that apparently no personage of great importance was buried in the mound, for the funeral gifts buried with the dead were very scant.

Almost without exception the young individuals were buried in an extended position, arms to side, and legs straight out. On the other hand, the adults were all buried in a flexed position, with arms drawn up to the face or chest, and legs drawn up so that the knees were upon the abdomen or chest.

The age of the mound is probably in the neighborhood of 500 to 1000 years. It is known that as soon as the white man came into contact with the Indian the trade material of the whites became objects of value and pride to the Indian and were buried with him. No objects of European manufacture were found in the mound, a fact which argues for the pre-historicity of the mound and its contents.

Associated with several burials of adult women were found ornaments of perforated shell serving as pendants. Around the neck of a child were found two "buttons" of shell, which had evidently been strung on a thong, as a necklace.

The presence of these ornaments, together with bone implements made of the foreleg of the deer, links this mound with the mounds and village material excavated at Channahon, some 12 miles to the west of Joliet, by George Langford of Joliet.

Mr. Krogman was assisted in the field by Robert Engberg, George Neumann, Robert Jones, Henri Denninger, Fred Eggan, all graduates of the University of Chicago, and Thorne Deuel, a graduate of Columbia University of New York.

Science News-Letter, October 13, 1928

Training Indian Boys

Ethnology

CHIEF BUFFALO CHILD LONG LANCE, in *Long Lance* (*Cosmopolitan*):

Abstinence from overeating and overindulgence in physical comforts was very rigidly enforced on us by our parents, whose sole aim with us seemed to be to keep us tough and fit. We were never allowed to stand close to the fire, lest our bodies should get overheated and make us lazy. And our parents never allowed us to eat fat meats of any kind. That, they said, would make our stomachs soft.

We youngsters were given daily lectures on how to live, by twelve of the oldest men of the tribe. Because they had lived to such remarkable ages it was considered that they knew better how to live than anyone else. Every morning just before sunrise, while the camp still lay on their pallets in their teepees, one of these old men would take his turn in getting up early and walking through the camp, shouting out his lecture on how to live to be old and his advice on morals, courage, and personal bravery. His voice would awake us, and we would lie still and listen intently to every word he said. At that time of the morning, just as we had awakened from a night's rest, his words seemed to pierce deep into us; we remembered every word he said, and all during the day his advice would keep coming back into our minds, and we would try to live up to it.

All of these men were great warriors who had many scalps to their credit, and we respected our old people above all others in the tribe. To live to be so old they must have been brave and strong and good fighters, and we aspired to be like them. We never allowed our old people to want for anything, and whenever an one of them would stop as he made his silent, dignified way through the camp, and put his arm across our shoulders and utter a little prayer for us to the Great Spirit, we would feel highly honored. We would stand quietly, and when he was through we would remain in our tracks, respectful and silent, until he had disappeared. We looked upon our old people as demigods of a kind, and we loved them deeply; they were all our fathers.

This respect for the aged was so deeply bred into us that to this day I have not the courage to dispute the word of an old person. To me old people still are demigods to be heeded and reverenced at all times.

How to Make Your Own Radiovisor

Radiovision

This is the fifth in a series of articles prepared especially for Science Service by one of the pioneer inventors in movies and television. Copies of the SCIENCE NEWS-LETTER containing the first four installments may be obtained from Science Service for $.15 each.

By C. FRANCIS JENKINS

The radiovisor is now ready for the motor.

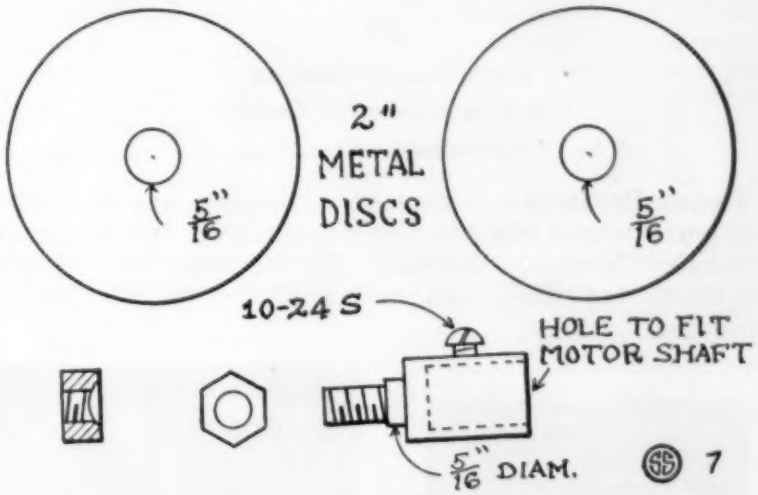
Almost any small motor will do, A. C. or D. C., to suit your house current, and 1/20 h. p. is ample.

On the shaft of the motor put the hub with nut and flanges, shown in illustration, between which a rubber driving flange is clamped. This driving flange is cut from a punctured or blown-out inner tube automobile tire.

First cut a center hole 5/16 inch diameter. Cut the disc out roughly and put it on the motor hub. Start the motor and touch the disc with a pencil about 1½ inches from the motor shaft center. Now take the rubber disc off and with sharp scissors cut on the pencil line, which will give you a 3-inch rubber driving disc when clamped between the flanges of the motor hub and the nut tightened.

Do not use more than two friction discs together, cut from the average thickness of inner tubing; one thickness is usually best. The disc will chatter a little at starting, but the synchronism is more easily held with a thin disc after it is up to speed.

The motor hub detailed in the drawing is best made in a machine shop. But a less permanent driver can be made by fastening the rubber with shellac to a wooden disc slipped tightly on the motor shaft.



The motor and drive are now ready to attach to the radiovisor.

Set the motor on the motor board, and fasten it in such a position that the rubber disc bears against the back of the scanning disc about 2½ inches from the axis of the scanning disc, when the motor board is midway of its possible movement. If a paper scanning disc is used it may be necessary to put it between two 10-cent store toy talking machine records for the driving disc to bear against.

Synchronism is attained by moving the motor board to or from, the center of the scanning disc, by the screw S shown in the illustration. This should be a long-shank round-head ¼-inch machine screw with nut, or a square-headed bolt about 3½ or 4 inches long. Solder into the slot of the screw a wing to facilitate rotating it, or into a hacksaw slot in the bolthead. Put the nut in the ⅝-inch hole of the guide strip on the bottom of the motor board, and screw the bolt into it through the hole provided therefor, which will leave the wing-nut at the end of the baseboard readily accessible for moving the motor to and fro.

Don't use a rheostat in circuit with the driving motor; let it run at its natural period, the speed for which it was designed; synchronism is attached by changing the distance of the motor from the center of the scanning disc, *not by changing the motor speed.*

Science News-Letter, October 13, 1928

Aqueous Intoxication

Physiology

Intoxication by water is declared possible by Dr. Oliver Kamm of Detroit. Whether water is a harmless beverage depends upon the amount imbibed and the cellular constitution of the imbiber. The four glasses a day recommended by one of the insurance companies which has taken on the task of protecting the people's health may be too heavy drinking for a few individuals, while others may drink several gallons of water a day without slaking their abnormal thirst. Dr. Kamm has found that the amount of water demanded is dependent upon the activity of the posterior portion of the pituitary gland at the base of the brain. This little organ secretes two kinds of hormones, or regulators of the human system, so much alike that they have been called "the pituitary twins," but have recently been separated and are now employed in medicine for different purposes. They are distinguished as A and B, or on account of the traditional fondness of scientists for Greek, as alpha and beta. The beta secretion regulates the water supply. The portly person who persists in putting on weight in spite of cutting down his diet and drink may be suffering from an excessively active pituitary gland or from the undue sensitivity of his tissues to the secretion. He is called "fat" by his friends or his enemies, but he may be merely water-logged. On the other hand, the scrawny man, who remains lean however much food and water he takes, may have the opposite defect of pituitary action and be suffering from desiccation. This same beta hormone aids the frog in changing his skin color to suit his surroundings as a kind of camouflage. A frog in his light-colored costume turns dark on being treated with a minute dose of the hormone, because this expands the black cells in his skin. Dr. Kamm suggests that this secretion may save life in the case of extensive body burns, since the danger here is from the undue drying of the tissues.

Science News-Letter, October 13, 1928

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of Science News-Letter, published weekly at Baltimore, Md., for October 1, 1928.
District of Columbia
City of Washington
ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Edwin E. Slosson, who, having been duly sworn according to law, deposes and says that he is the Publisher of the Science News-Letter and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Edwin E. Slosson, 21st and B Sts., Washington, D. C.

Editor—Watson Davis, 21st and B Sts., Washington, D. C.

Managing Editor—Watson Davis, 21st and B Sts., Washington, D. C.

2. That the owner is:

Science Service, Inc., 21st and B Sts., Washington, D. C., a non-profit making corporation and scientific institution.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) Edwin E. Slosson.

Sworn to and subscribed before me this 25th day of September, 1928.

(SEAL) Charles L. Wade.

(My commission expires April 6, 1933.)

A Dog's World—*Cont'd*

fading to gray. At such a time a moving object against the gray would catch the eye sharply, which may account for the dog's quick alertness at any moving object.

Studying dogs will not only reveal the facts about a dog's behavior. There are a tremendous number of human problems that can be worked out with dogs, Dr. Watson believes.

"I think we can produce psychopathic dogs and thus shed light on nervous diseases," he declared.

At the Pavlov laboratories, Anrep produced a nervous state in a dog, Dr. Watson pointed out. The dog learned that food appeared at the sight of a luminous circle, but not when an ellipse was shown to him. Then the physiologist began to make the test harder by showing the dog ellipses that were more and more rounded, like the circle. When the problem became too hard, the dog could not make decisions and began to be nervous. It wriggled and squealed, and tore off the apparatus that was attached to it, and in general suffered from what a human being might call a nervous breakdown, if he were placed in a situation where the problem was too much for him.

"Society will not let scientists produce nervous diseases in men," said Dr. Watson, "but when we know how these conditions become established, we can more surely proceed to remove them. It can be done with dogs, and the field is all new. It opens up a world of possibilities in establishing fears and removing them. We can make a dog that would fight another dog of any class or type, and we can make a coward of another dog."

Children's feeding habits are another problem that can be tried out on the dog, with enlightening results, Dr. Watson believes. In some of the polar expeditions, dogs developed an abnormal feeding condition because they could get nothing to eat except rotten meat. When the dogs returned to civilization, they were so accustomed to this food that they could eat nothing else, and the problem of building up new habits of normal eating was a difficult one. When a condition of this sort is understood in a dog, and when the dog can be reconditioned, it may be easier, Dr. Watson says, to cure a child's unreasonable aversion for spinach or an abnormal habit of licking paint off a chair.

Radio Produces Artificial Fever

Physiology

A brand new method of experimentation in physiology that may very likely prove a new method of cure for certain diseases is opened up by recent work at the Albany Medical College by Dr. Helen R. Hosmer. She has been making a careful study of the effects on animals of short radio waves of from 25,000 to 10,000 kilocycles (12 to 30 meters), and will make a preliminary report of her work in the forthcoming issue of *Science*. The effect was noticed when bystanders around a 20-kilowatt, 5-meter transmitter found that their temperature was raised. The mouth temperature of one person rose 2.2 degrees in fifteen minutes, while others showed a somewhat smaller rise, or fever.

Dr. Hosmer has measured the effect of the waves from a special 750-watt transmitter, furnished for the purpose by the Research Laboratory of the General Electric Co., in heating a weak solution of ordinary salt. Such a salt solution is very similar to the fluids of the body in its behavior. The rate at which the temperature of the solution rose depended on the wavelength and the strength of the solution. With a frequency of 25,000 kilocycles, corresponding to 12 meters, a strength of one part of salt to 2000 of water was heated most rapidly, while with 10,000 kilocycles (or 30 meters) a solution of only half this strength was heated at the fastest rate. The liquid was placed in a tube between two parallel metal plates connected with the transmitter.

When a tadpole was placed between the plates, its temperature rose three degrees in 31 seconds while it was alive and 12 degrees in 2 minutes after it was dead. This was with a single tadpole, when there were a number together the rate of heating was higher. Experiments were also made with rats.

Though Dr. Hosmer points out the extreme danger of exposing human beings to these waves until much more is known about them, she states that it affords a new and important field for the experimental physiologist. Now he can induce fever at will without introducing poisons, bacteria, or other foreign bodies into the blood. As malaria has been found useful in the cure of progressive paralysis, an effect believed to be due to the heating of the body by the malarial fever and consequent killing of the germs, fever caused electrically may prove useful instead. This would eliminate the bad effects of the malaria.

Similar experiments along this same line, but without such powerful apparatus, have been made by Dr. W. T. Richards of Princeton University, and Alfred L. Loomis of the latter's private laboratory at Tuxedo Park, N. Y.

Indians Neglected Jewels

Anthropology

Native Americans, who preceded the white man in the possession of this continent, seem to have made little effort to mine the treasures in their reach, according to Dr. George F. Kunz, well known authority on precious stones. Although diamonds have been found in thirty-five localities in the United States, they were never worked by prehistoric Americans. With all the gold in California, there was no gold mined or worked by Indians of that particular region. It was the Spaniards who really set the Indians to hard labor in the search for precious stones and metals.

How public opinion can help or hinder the progress of American archaeology is pointed out by Dr. Carl Guthe, of the committee on state archaeological surveys of the National Research Council. There is considerable digging among American antiquities by amateurs and traders who do not realize that the old pottery, beads, and other relics are really parts of important historic documents, Dr. Guthe said. Removing such things from the soil without first carefully recording all evidence as to their age and significance, and then making collections out of these isolated specimens is about as useful as cutting the "ands" out of valuable old manuscripts and marveling at the different penmanship of the old writers. The great importance of archaeological expeditions is not the collections they can make but what new things they can learn about the past civilizations of the world. Public opinion condemning the practice of spoiling American antiquities for science would be more powerful than legislation, he said.

End of the Reading Age

Philosophy

SIR PHILIP GIBBS in *The Day After Tomorrow* (Doubleday, Doran):

Now, when television comes and reaches its full development, reading may become only the hobby of old-fashioned folk and great students. Perhaps it may destroy all of us writing men—novelists and newspaper writers—for who will have time to read us when life is speeded up to that extent, and the experience of a lifetime to our forefathers may now be crowded into an hour or two? Who will want to read novels or study history when one's mind may travel to new scenes more quickly even than one's body, which is going to be very quick in getting around from one place to another? Perhaps the very knowledge of reading and writing may in time disappear from the world, when one can talk and listen so easily across great spaces. Perhaps these new inventions may destroy the inherited culture of the ages, so that we shall lose interest in the past, with its literature and art, because the present will come crowding in upon us with a thousand new interests and amusements and curiosities and the future will hold more passionate excitement. It is happening already. Broadcasting is taking the place of reading in many households where formerly a family gathered over its books in winter evenings. The cinema is already the rival of the bookshop. It is so much easier to watch than to read. That abandonment of reading may happen altogether, if not the Day after Tomorrow, then in the not greatly distant future.

Science News-Letter, October 13, 1928

Darwin's House a Scientific Shrine

Biology—History of Science

Readers of the SCIENCE NEWS-LETTER will be interested in the following extracts from an account published by the British Association for the Advancement of Science of Darwin's famous home—Down House—which is to be made a scientific shrine. George Buckston Browne, F. R. C. S., a famous English surgeon, has presented the house to the British Association, with an endowment sufficient to maintain it in perpetuity.

At present Down House serves as a private school. When the tenant's lease falls in or is acquired, the donor desires that the property be regarded as a gift to the nation and opened to visitors every day of the week between the hours of 10 and 6, without charge. He also desires that the Association should use Down House and grounds for the benefit of science. The donor has also suggested that certain of the rooms—particularly the old "study," in which the *Origin of Species* was written—should be furnished, as near as may be possible, as they were when Darwin lived in them. The donor has already taken steps to secure this end and has obtained the willing cooperation and greatest assistance from various members of the Darwin family. Indeed, without the generous cooperation of the Darwin family the transfer of ownership could not have been effected. The late Mrs. Litchfield, the third daughter of Charles Darwin, bequeathed for Down House her father's study chair and letter-weighing machine. Thanks also to the generosity of other members and friends of the Darwin family—Major Leonard Darwin, Prof. Charles G. Darwin, Mrs. Perrero, and Mrs. Berkeley Hill—together with acquisitions made by himself, Mr. Buckston Browne has already got together the nucleus of a Darwin collection for Down. He has commissioned the Hon. John Collier to paint replicas of his well-known portraits of Darwin and of Huxley to be hung at Down House; these commissions are already completed. It is hoped that the shelves of the old study may be filled with all editions of Darwin's works, and that Down House may become a repository of Darwiniana where students will have an opportunity of consulting all original documents concerning Darwin and his writings. Such an end can be attained only if the British Association succeeds in enlisting the sympathetic cooperation of all who may be the fortunate owners of articles which were in the possession of Darwin or were associated with his life.

. . . . . .

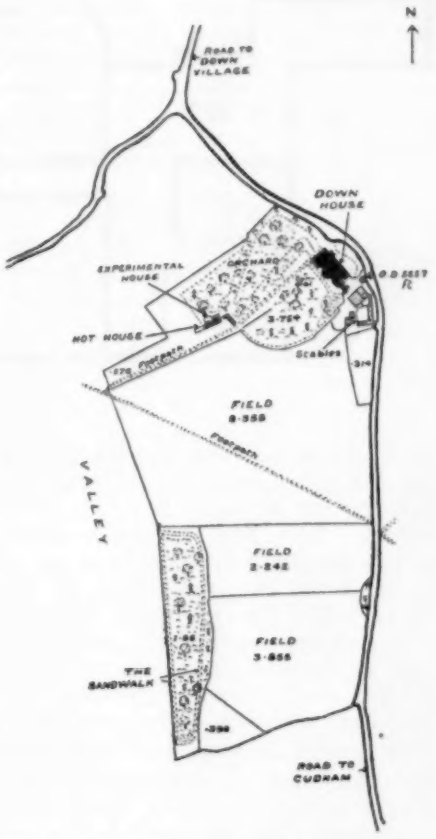


Fig. 1.—The grounds around Down House

It may not be amiss to recount some of the circumstances which led up to the appeal for the preservation of Darwin's home. Some years before his death the late Sir Arthur Shipley, Master of Christ's College, Cambridge, where Darwin was an undergraduate, wrote to a member of the British Association as follows: "It seems to me that Down House ought to be a national possession. Do you know of any means by which this can be brought about?" On the eve of the Leeds Meetings of the British Association on August 31, 1927, the Council of the Association considered this matter and empowered the then President (Sir Arthur Keith) to make a public appeal at the close of his presidential address to the assembled Association. An urgent SOS was sent out with the happy result which all now know. It was with as much surprise as satisfaction that Sir Arthur Keith learned that the man who answered the call was a Fellow of his own College. Indeed, he knew Mr. Buckston Browne as a generous benefactor to that College and to the Harveian Society, but was unaware of his love for Darwin and for Down. It was later that he learned that Darwin's friend Huxley had long ago exerted an abiding influence on the donor of Down.

Darwin was born at Shrewsbury, February 12, 1809. Down House was purchased for him by his father, Dr. Darwin, and he took up his residence there on September 14, 1842. Darwin was then in his thirty-fourth year; three years previously he had married his cousin, Emma Wedgewood. His two eldest children, William and Anne, were born in London; the third, Mary, was born and died just after arrival at Down. Then followed in 1843 Henrietta, who became Mrs. Litchfield; in 1845 George, who became Sir George Darwin, F. R. S., and whose son, Prof. Charles Darwin, F. R. S., succeeded to the ownership of Down and is the fifth of a succession of father and son who have been elected Fellows of the Royal Society—an unique record; in 1847 Elizabeth was born; in the following year Francis, who became Sir Francis Darwin, F. R. S.—a distinguished botanist and president of the British Association. His son, Bernard Darwin, is known to all as an exponent as well as an authority on golf. Leonard followed in 1850—Major Leonard Darwin, scientist, philanthropist and the founder and still active supporter of the Eugenics Society. Then came Horace, now Sir Horace Darwin, F. R. S., happily still alive. And last number ten, Charles Waring Darwin, who died in childhood. Down was thus the home of a large and happy family, perhaps the most gifted family ever born in England. There the great naturalist died on April 19, 1882, in his seventy-fourth year. He worked continuously at Down for almost forty years.

In that period he made his first draft of the *Origin of Species* (1842), he wrote his researches on the *Zoology of the Beagle*, on *Coral Reefs*, and prepared a new edition of a *Naturalist's Voyage*. Before he settled down to work at *Barnacles*, to which he gave seven years (1847-54), he prepared his papers on *Volcanic Islands* and on the *Geology of South America*. Preparations for the *Origin of Species*, which did not receive its final form until 1858-59, went on continuously from 1842 (*Turn to next page*)

Darwin's House a Scientific Shrine—*Continued*

onwards. Then followed his inquiries into *Fertilisations of Orchids* (1862), *Variations of Animals and Plants under Domestication* (1868), *Descent of Man* (1871), the *Expression of the Emotions* (1872), *Movements and Habits of Climbing Plants* (1875); *Insectivorous Plants* appeared in the same year; *Cross and Self Fertilisation* in 1876, and his last work of all, one which was begun soon after he settled at Down, *The Formation of the Vegetable Mould through the Action of Worms*. No single home in the world can show such a record. Truly from Down Charles Darwin shook the world and gave human thought an impress which will edure for all time. Down is a priceless heirloom not only for England but for the civilized world. One of the greatest men of all time lived there.

As to the character of Down House, much is to be learned from the account which Sir Francis Darwin has given in his father's biography:

"On September 14, 1842, my father left London with his family and settled at Down. In the autobiographical chapter his motives for moving into the country are briefly given. He speaks of the attendance at scientific societies and ordinary social duties as suiting his health so 'badly that we resolved to live in the country, which we both preferred and have never repented of.'

"The choice of Down was rather the result of despair than of actual preference; my father and mother were weary of house-hunting, and the attractive points about the place thus seemed to them to counterbalance its somewhat more obvious faults. It had at least one desideratum—namely, quietness. Indeed, it would have been difficult to find a more retired place so near to London. . . . It is a place where newcomers are seldom seen, and the names occurring far back in the old church registers are still known in the village.

"The house stands a quarter of a mile from the village, and is built, like so many houses of the last century, as near as possible to the road — narrow lane winding away to the Westerham high road. In 1842 it was dull and unattractive enough; a square brick building of three stories, covered with shabby whitewash and none of the shrubberies or walls that now give shelter; it was overlooked from the lane, and was open, bleak, and desolate.

"The house was made to look neater by being covered with stucco, but the chief improvement was the building of a large bow of three stories. This bow became covered with a tangle of creepers, and pleasantly varied the south side of the house. The drawing-room, with its verandah opening into the garden, as well as the study in which my father worked during the later years of his life, were added at subsequent dates.

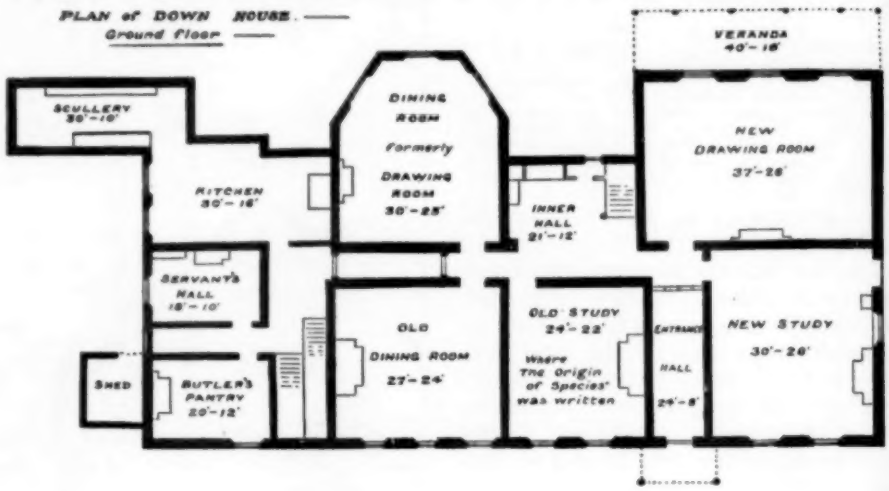
"Eighteen acres of land were sold with the house, of which twelve acres on the south side of the house form a pleasant field, scattered with fair-sized oaks and ashes. From this field a strip was cut off and converted into a kitchen garden, in which the experimental plot of ground was situated, and where the greenhouses were ultimately put up."

To fill in some further details of this picture of Down we may also draw upon the description given by Mrs. Litchfield, in the life of her mother, Mrs. Darwin—(*Emma Darwin*, privately printed 1904).

"For some time there had been a growing wish on the part of my parents to live in the country. Their health made London undesirable in many ways, and they both preferred the freedom and quiet of a country life. They decided to buy a country house, but out of prudence resolved upon not going beyond a moderate price, and as they also wished to be near London, there was a weary search before they found anything at all suitable. In her little diary, under July 22, 1842, I find the entry *'went to "Down,"'* and this I think must have been the first sight of her future home. It was bought for them by Dr. Darwin for about £2,200, and the purchase was quickly completed, for they moved in on September 14, 1842.

"Down was then ten miles from a station, and the whole neighborhood was intensely rural and quiet, though only sixteen miles from London Bridge."

The two accompanying plans, the data for which were obtained through the kindness of Major Leonard Darwin, will give a precise idea of the extent of the property and of the plan of Darwin's home. Fig. 1 shows the arrangement and extent of the grounds; the figures indicate the acreage of each part. Down House is seen to be situated at 565.7 feet O. D. The plantation with the sand walk around it—Darwin's "thinking path"—with the dry chalk valley beyond, are depicted; so, too, are the orchard, gardens and hot-houses. In Fig. 2 is given a plan of the ground floor of Down House, the dimensions of each room being indicated in feet. It will be seen to be a commodious house, and remains just as Darwin lived in it. He added a new wing—that which includes the "New Study and the New Drawing Room."



Science News-Letter, October 6, 1928

London theaters of Queen Elizabeth's day were closed whenever deaths from the plague reached about thirty in a week.

A dog doubles its weight in the first eight days of life, whereas a baby takes six months to double its weight.

Heat released by the sun yearly is equal to that produced by a burning mass of coal equal to 60 of our earths.

NATURE RAMBLINGS

By FRANK THONE

Natural History

False Alarms

With the coming of later autumn and winter in sight, we may expect local fruitstore thrillers, when some one opens up a new bunch of bananas and finds a hairy monster of a tarantula staring him in his startled face. If the big spider is not forthwith sent to Limbo with a broom or box-end, it may be captured and set on a counter in a glass jar, for the shuddering admiration of the multitude. And many will be the tales of its instantaneous deadliness. Apparently the majority of even well-informed persons still believe that a tarantula can leap twenty or thirty feet, and that its bite will kill you within a few seconds.

Nothing could be farther from the fact. The fruit tarantula can not jump at all; even its running is sluggish, at least at the end of a long voyage and rail journey. And even if it could make such leaps it would be virtually leaping in the dark, for tarantulas are so short-sighted that they pay no attention to objects only a few inches away from their numerous eyes. It is highly probable that they can not really see anything at all, but merely distinguish moving from stationary objects. So why jump at something you can't see?

As for his deadliness, that is equally exaggerated. Most tarantulas won't even offer to fang you unless you pick them up and squeeze them, or blow tobacco smoke on them, or otherwise offer them insult. Venom is expensive, and isn't to be wasted except in self-defense. And even if Mrs. T. does decide to take a whack at you, the chances are that all you'll get out it is a sore hand and maybe a headache. Dr. E. H. Ewing of the U. S. National Museum keeps a few pet tarantulas in cages in his laboratory all the time. He lets them parade up and down his arm for the delectation of visitors. And he's never been bitten yet.

Science News-Letter, October 13, 1928

Undersea Camera Gets Tide Data

Oceanography

A unique motion-picture camera, recording automatically the velocity and direction of currents beneath the surface of the water, was used to advantage this past summer by the U. S. Coast and Geodetic Survey during what is stated to be the most comprehensive survey of tide and current conditions in Chesapeake Bay ever attempted.

While the device is so new that it has not yet been perfected fully, it has shown results that indicate it will be used as a regular part of standard current testing equipment. The camera is designed to take the place of a complete human observing unit composed of one boat, one officer and six men. It contains within it a compass and revolution dial of which pictures are made each half hour, and works continuously without attention for an entire week.

The purpose of the Survey's work this summer was to bring aids to navigation, such as mariner's charts and current tables, absolutely up to date. From the data gathered this year and last, current tables will be published from which at any future time the direction and velocity of currents at any place in the Bay may be ascertained. The information likewise will be valuable in enabling engineers of surrounding cities to make proper disposal of their sewage. They must know at precisely what point the ebb of the tide will be able to convey the sewage farther out to sea than the flood current is able to bring it back.

Fishing interests will be aided by the data since certain fish are known to bite better at certain tidal stages than at others.

Headed by Lieut. George L. Anderson, the Survey engineers, four all told, conducted their investigations from four 65-foot launches. A unique feature was that 24 college boys, selected from leading universities in the East and Mid-West, acted as special observers, their purpose being to gain technical experience to add to their engineering knowledge.

Science News-Letter, October 13, 1928

Storms Cause Static

Radio

Thunderstorms are guilty of the production of the static that occasionally interrupts radio reception, especially in summer. They also cause the formation of cathode rays—the rapidly moving electrons or atoms of electricity that cause X-rays when they are stopped by a heavy metal. This is the opinion of R. A. Watson Watt, British government radio engineer. But even though this static is the bane of good radio reception, it has its use, said the speaker. The weather observer can use this to locate distant thunder-storms, and he told the scientists how he had developed a special form of radio direction finder for the purpose. An experimental receiver of this kind has been ordered by the U. S. Navy, he stated. Several years ago, when the U. S. Navy was experimenting with a receiver for getting weather maps on ships at sea, some similar experiments were made. The weather map receiver, the invention of C. Francis Jenkins of Washington, was attached to a direction finder, and the course of the tropical hurricane which later struck Miami was recorded.

Science News-Letter, October 13, 1928

The world wheat crop for 1928 is estimated to be lower than in 1927.

Pueblos Lacked Vitamins

Physiology

The cliff dwellers who lived in the canyons of the southwest in prehistoric times never heard of vitamins and ultra-violet light, but a lack of these undreamed-of necessities was a main cause of their downfall, according to Dr. Walter Hough, of the Smithsonian Institution.

The decay of a race is one of the great problems of the world, Dr. Hough showed. The reasons for the passing of ancient cities and tribes may point a valuable and timely warning to modern civilizations.

A study of the food supply of the Pueblos was made in order to see whether it would account for their mysterious dwindling, beginning about 1000 A. D., long before the white man disturbed their country. Corn was their great food, and their diet was about 85 per cent. grain, the rest being meat and vegetables. The ration was adequate for sturdy adults but in winter the diet must have lacked in fat and vitamins and the children suffered, the scientist stated. Lack of fuel must have caused insanitary huddling in dark rooms of the pueblo in winter and this also weakened the babies.

Science News-Letter, October 13, 1928

The Religion of a Geologist

Theology

THOMAS C. CHAMBERLAIN, in *The Open Court, September,* 1928:

My fundamental theological prepossession is that whoever made the cosmic system was honest about it, and he made us in the circumstances honest. That is, we could not have evolved for billions of years or so in a factitious way; we evolved on sound lines in general. We are all full of shortages and mistakes and all that, but fundamentally the thing is as we see it.

It is among my theological dogmas that the optimist and the pessimist are both fools, but that the optimist is the more comfortable fellow of the two, and I am an optimist—on the whole. That is to say, I do not believe that the whole thing is going all right, and I do not think that the whole thing is going all bad. I never could accept the doctrine of total depravity. On the whole, the system, as I see it, taking the heavens and the earth and all that is in the earth together, is working towards order and towards efficiency, and the amount of wastage, irregularity, of disorder, is relatively small.

The things that disturb us are agitative and more or less destructive, but when you measure them up they are very, very small, compared with the orderly movements, which are so quiet we don't know anything about them.

The most comfortable religious opinion I have is that if an organization, an organism, or a being does not take itself into the universal system, the system cuts it out.

There may be more devils than saints in the world, but the devils die before the saints—they commit suicide. It is a fundamental theological principle of mine that the devil is a fool. He would not be a devil if he were not a fool. While he is acting smart and seems to be bright, he is playing the fool all the time. He ought to get in accord with things—in harmony with the system.

That is what righteousness is. For instance, I do the right thing when I go to breakfast and eat the proper food in the proper amount, and in so doing do the thing that is best for my system. If I go down there and gorge myself, that is sin. Indulgence in strong liquor is destructive. So it is all through life. When we do the thing that fits us into the organization, into the general cosmos, and help on the system and work with it, both for ourselves and for the system, then we are cosmically righteous. If we do not, we are Mephistophelian, and the cosmos cuts us out.

It is to me a comforting thought that those who try to live in accord with their relations and obligations of all sorts prosper on the whole, and the others are killed off. If nine-tenths of the human race chooses to go to destruction, the one-tenth will live on.

Science News-Letter, October 13, 1928

Negro colleges in the United States have more than doubled in number in the past ten years.

Spraying perfumery on ether masks has been tried by German surgeons to make the anesthetic less trying to take.

FIRST GLANCES AT NEW BOOKS

ENGINES—E. N. daC. Andrade—*Harcourt, Brace* ($3). For many years the Christmas lectures, given at the Royal Institution, have been an important part of the intellectual life of London, interesting not only to the children for whom they are theoretically intended, but to adults as well. To read a list of those who have given the lectures is to call a roll of most of the leading names in British science in the past century. The present book contains the lectures given in this series last year by Prof. Andrade, and it is in all respects a worthy member of the series. He shows how scientific principles have been applied to give us the many sources of mechanical power that we have today. In addition, he tells of many new or less-known things about them. For instance, one reads of the Kitson-Still locomotive, which combines a Diesel and steam engine; and of the Michell thrust block, which makes possible efficient propulsion of the largest liners. Finally, since the refrigerating machine is simply an engine reversed, he brings it in as well. And throughout the language is simple. *Mechanics*

Science News-Letter, October 13, 1928

AN EASY POCKET STAR GUIDE FOR BEGINNERS—H. R. Kingston—*Author* London, Ontario ($ .50). This is a little booklet, small enough to slip into the vest pocket, containing the star charts for each month, from McKready's "Beginner's Star-Book" (*Putnam*). In addition, there is a list of English equivalents of the Latin constellation names, and a table showing the positions of the planets until 1933. For anyone who desires a particularly handy set of star charts, this is just the thing.

Astronomy

Science News-Letter, October 13, 1928

STANDARDS AND STANDARDIZATION—Norman F. Harriman—*McGraw-Hill* ($3). Here is a complete account of the science of standardization, written by a man who, as senior engineer-physicist of the Bureau of Standards, may be presumed to be an authority on the subject. The accounts of the development of standards, and of the standards that are in use today, are especially interesting. A complete list of the standardizing bodies of the world is also of considerable value. *Engineering*

Science News-Letter, October 13, 1928

BEYOND THE ELECTRON—Sir J. J. Thomson—*Cambridge Univ. Press* ($.80). Probably no living physicist is better qualified to talk about the structure of the electron than Sir Joseph. Here, in a lecture given recently in England, he summarizes the latest views, including some new work of his son, Prof. G. P. Thomson, that affords new evidence of the wave nature of electrons. The mathematical parts are relegated to an appendix, so it is a booklet to be recommended to anyone who wants to know of the latest scientific ideas on this important subject.

Physics

Science News-Letter, October 13, 1928

PRINCIPLES AND METHODS OF JUNIOR HIGH SCHOOL MATHEMATICS—J. Herbert Blackhurst—*Century* ($2.50). With the importance of mathematics in all branches of science, it is especially important that the student be properly grounded. This practical textbook tells the embryo teacher how to do it.

Mathematics

Science News-Letter, October 13, 1928

FUN WITH FIGURES—A. Frederick Collins—*Appleton* ($2.00). Magic squares, perpetual motion schemes, oddities of numbers, perpetual calendars, illustrated with clever drawings by the author, make up this book. Every mathematics or science teacher should have it to enliven his courses.

Mathematics

Science News-Letter, October 13, 1928

DOES THE EARTH ROTATE—William Edgell—*Author* (Radstock, Somerset, England) (2s). Here is the latest contribution of the flat and stationary earth paradoxes that DeMorgan so ably handled in his classic "Budget of Paradoxes." The author's arguments are not likely to mislead any reader of the NEWS-LETTER. A book of this nature is not without its usefulness, however. For one thing, it might be useful as an exercise for students, to have them point out the fallacies. Also, it demonstrates that there is still work for science educators for, nearly four centuries after Copernicus, there are still people who are unconvinced of what those who have made it their lifetime study recognize as proven fact.

Astronomy

Science News-Letter, October 13, 1928

THE ENGINEER: HIS WORK AND HIS EDUCATION—R. L. Sackett—*Ginn* ($1.40). With the spotlight shining anew on the engineering profession because of the selection of one of their number as Republican candidate for President, many young men are considering it for their life work. This little book is just the thing to put into the hands of the young men who want to know what engineering is, what are the distinctions between its various branches, how does it pay, and how should one go about getting into it.

Engineering

Science News-Letter, October 13, 1928

ALADDIN U. S. A.—Ernest Greenwood—*Harper* ($2.50). A popular and interesting account of electricity in America. Edison contributes a brief foreword.

Electricity

Science News-Letter, October 13, 1928

NEMA HANDBOOK OF RADIO STANDARDS—*Natl. Elec. Mfrs. Assn.* ($2). Here are summarized the standard definitions of radio terms, standard symbols used in wiring diagrams, standard methods of testing, etc. Anyone who has to do any writing, drawing or lecturing in connection with radio will find it a useful reference work.

Radio

Science News-Letter, October 13, 1928

THIRTEENTH ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS—*Government Printing Office* ($1.25). The latest edition of this annual publication contains a valuable summary of progress in aviation during the past year, in addition to the reports of the activities of the committee, and 26 technical reports on aeronautical engineering.

Aviation

Science News-Letter, October 13, 1928

ELEMENTS OF AVIATION—Virginius Evans Clark—*Ronald Press* ($3.00). In this new work in the publisher's aeronautic library the reader will find summarized the principles of airplane flight without the mathematics of more technical treatises. Also, says the author in his preface, it is intended to help the members of the general public who want to be able to speak the language of aeronautics with assurance. A foreword by General Patrick testifies to the author's qualifications. *Aviation*

Science News-Letter, October 13, 1928

Science is the most romantic thing in the world today——

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SO astounding are many of the things accomplished by science nowadays that we are apt to regard them with dumb wonder, as though they were fairy-tales. The true romance of science, however, lies not merely in its incredibility, but in the fact that every one of its amazing achievements plays a useful part, directly or indirectly, in our daily lives. Marvels of Science makes clear the hundreds of ways in which our comfort and happiness depend on the researches of experimenters in the field of pure science.

What Do You Know About Glass? About Paint?

Here are two simple, everyday substances, so familiar that it seems hard to believe they harbor any secret mysteries. Yet Mr. Wisehart enumerates so many extraordinary and unsuspected properties of these "simple" materials that they become invested with all the charm of romance. One is less surprised to find radium, asbestos and the X-ray listed among the marvels of science, but here again the vast range of their usefulness is astounding. Other chapters of breathless interest describe the endless procession of new things to eat, wear, play with and work with which chemistry is furnishing us; the delicate instruments in use at the U. S. Bureau of Standards; the war of science against insects; and the amazing underground engineering feats to be met with on a tour "under the sidewalks of New York."

MARVELS OF SCIENCE

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